CLAIMS:

1. A process of forming a microelectromechanical device by a deep reactive ion etching process during which a substrate overlying a cavity is etched to form trenches that breach the cavity to delineate at least two suspended structures, a first and a second of the suspended structures having a first and a second predetermined width, respectively, in a direction parallel to a surface of the substrate, the first suspended structure being farther from an anchor site of the substrate than the second suspended structure, the process comprising the steps of:

masking first and second surface regions of the substrate corresponding to the first and second suspended structures, respectively, in preparation for the etching process so that other surface regions of the substrate corresponding to the trenches remain exposed, the first masked surface region being wider in the direction parallel to the surface than the first predetermined width of the first suspended structure; and then

forming the first and second suspended structures by the etching process during which the exposed surface regions of the substrate are etched to form the trenches that delineate the first and second suspended structures and breach the cavity, after which the first suspended structure is subjected to more rapid backside and lateral erosion than the second suspended structure so that at the completion of the etching process the first and second suspended structures have the first and second predetermined widths, respectively.

2. The process according to claim 1, wherein the second masked surface region has a width in the direction parallel to the surface that is approximately equal to the second predetermined width of the second suspended structure.

3. The process according to claim 2, wherein the first and second predetermined widths are approximately equal.

4. The process according to claim 1, wherein the microelectromechanical device comprises a proof mass supported above the cavity and a rim surrounding the proof mass and the cavity.

5. The process according to claim 4, wherein the first suspended

structure is one of a first plurality of fingers projecting from the proof mass and each of the first plurality of fingers has a width substantially equal to the first predetermined width, the second suspended structure is one of a second plurality of fingers projecting from the rim and each of the second plurality of fingers has a width substantially equal to the second predetermined width, and the first and second plurality of fingers are interdigitized.

6. The process according to claim 5, further comprising a stiction bump on each of the second plurality of fingers facing an adjacent one of the first plurality of fingers.

7. The process according to claim 5, further comprising multiple stiction bumps on a surface of the cavity beneath only the proof mass.

8. The process according to claim 7, wherein the stiction bumps are not present on the surface of the cavity beneath any of the trenches.

9. The process according to claim 1, wherein the first and second suspended structures are first and second portions of a single suspended element such that the first portion of the suspended element is farther from the anchor site of the substrate than the second portion of the suspended element, the first and second masked surface regions define a continuous masked surface region corresponding to the suspended element during the masking step, the continuous masked surface region is between two exposed surface regions of the substrate during the masking step, and the suspended element is between the trenches that delineate the first and second portions of the suspended element following the forming step.

10. The process according to claim 9, wherein the continuous masked surface region corresponding to the suspended element has a uniform width, portions of the two exposed surface regions adjacent the second portion of the suspended element are wider than portions of the two exposed surface regions adjacent the first portion of the suspended element such that each of the two exposed surface regions are tapered, and prior to the cavity being breached during the forming step, the portions of the two exposed surface regions adjacent the second portion of the suspended element etch more rapidly than the portions of the two exposed surface regions adjacent the first portion of the

suspended element.

11. The process according to claim 9, wherein the first masked surface region corresponding to the first portion of the suspended element is wider than the second masked surface region corresponding to the second portion of the suspended element such that the continuous masked surface region corresponding to the suspended element is tapered, and each of the two exposed surface regions have uniform widths.

12. The process according to claim 1, wherein one of the first and second suspended structures is more fragile than the other.

13. The process according to claim 12, wherein as a result of the masking step, a first of the exposed surface regions delineates the more fragile of the first and second suspended structures and a second of the exposed surface regions delineates the other of the first and second suspended structures, the second exposed surface region being wider than the first exposed surface region, the trench etched in the second exposed surface region breaching the cavity before the trench etched in the first exposed surface region during the forming step.

14. The process according to claim 1, wherein a portion of the substrate overlying the cavity is deflected into the cavity prior to the trenches breaching the cavity during the forming step.

15. The process according to claim 14, further comprising multiple stiction bumps on a surface of the cavity beneath the substrate overlying the cavity, the stiction bumps being located on the surface of the cavity so as not to be contacted by the portion of the substrate deflected into the cavity.

16. A process of forming a microelectromechanical device that includes a substrate overlying a cavity and a rim surrounding the cavity, the process being a deep reactive ion etching process by which the substrate is etched to form trenches that breach the cavity to delineate multiple suspended structures, the multiple suspended structures comprising a proof mass supported above a floor of the cavity and separated from a central hub on the floor by a

first of the trenches, first fingers cantilevered radially outward from the proof mass and interdigitized with second fingers cantilevered radially inward from the rim and spaced apart from the first fingers by second trenches, and tethers suspended between and interconnecting the proof mass and the rim with a first portion of each tether being adjacent the proof mass and a second portion of each tether being adjacent the rim, each of the tethers being between a pair of third trenches, the first and second fingers and the first and second portions of the tethers having respective predetermined widths in a direction parallel to a surface of the substrate, the trenches defining at least first and second gaps having respective predetermined widths, the process comprising the steps of:

forming the cavity to have an annular shape surrounding the central hub, an outer perimeter, and a first plurality of stiction bumps on the floor of the cavity spaced apart from the central hub and the perimeter of the cavity;

masking surface regions of the substrate corresponding to the proof mass, the first and second fingers, and the tethers so that other surface regions of the substrate corresponding to the trenches remain exposed, the first plurality of stiction bumps being only beneath the masked surface regions corresponding to the proof mass, the masked surface regions corresponding to the first fingers being wider than the predetermined width of the first fingers, the masked surface region corresponding to at least one of the second fingers being masked to define a second stiction bump on the at least one second finger facing a corresponding one of the first fingers with which the at least one second finger is interdigitized; and then

micromachining the proof mass, the first and second fingers, and the tethers by the deep reactive ion etching process so that the exposed surface regions corresponding to the trenches are etched and the cavity is first breached by one of the trenches etched through one of the exposed surface areas away from the first and second fingers, and after etching the second trenches that delineate the first and second fingers the first fingers are subject to backside and lateral erosion that undercuts the masked surface regions corresponding to the first fingers so that at the completion of the etching process the first and second fingers, the first and second portions of the tethers, and the first and second gaps have their respective predetermined widths;

wherein the first plurality of stiction bumps are beneath only the proof mass, and the second stiction bump is present on the at least one second finger and faces the corresponding one of the first fingers with which the at least

one second finger is interdigitized.

17. The process according to claim 16, wherein the masked surface regions corresponding to the second fingers have widths approximately equal to the predetermined widths of the second fingers.

18. The process according to claim 16, wherein the predetermined widths of the first and second fingers are approximately equal.

19. The process according to claim 16, wherein each of the masked surface regions corresponding to the second fingers is masked to define a stiction bump, so that stiction bumps are formed on each second finger and face the first fingers with which the second fingers are interdigitized.

20. The process according to claim 16, wherein each of the masked surface regions corresponding to the tethers has a uniform width, portions of the exposed surface regions adjacent the second portion of each of the tethers are wider than portions of the exposed surface regions adjacent the first portion of each of the tethers such that each of the exposed surface regions on either side of each tether is tapered, and prior to the cavity being breached during the micromachining step, the portions of the exposed surface regions adjacent the second portions of each of the tethers etch more rapidly than the portions of the exposed surface regions adjacent the first portions of each of the tethers.

21. The process according to claim 16, wherein the masked surface regions corresponding to the first portions of the tethers adjacent the proof mass are wider than the predetermined width of the first portions and wider than the masked surface regions corresponding to the second portions of the tethers adjacent the rim, and the exposed surface regions on either side of the tethers have uniform widths.

22. The process according to claim 21, wherein the masked surface regions corresponding to the second portions of the tethers adjacent the rim are approximately equal to the predetermined widths of the second portions of the tethers.

23. The process according to claim 16, wherein the cavity is first breached by the first trench that separates the proof mass from the central hub.

24. A microelectromechanical device comprising:

a substrate having a cavity, a floor of the cavity, and a rim surrounding the cavity;

a proof mass supported within the cavity so as to have an axis of rotation perpendicular to the substrate;

first fingers cantilevered radially outward from the proof mass toward the rim;

second fingers cantilevered radially inward from the rim toward the proof mass and interdigitized with the first fingers; and

tethers interconnecting the proof mass and the rim;

wherein the microelectromechanical device further comprises at least one stiction bump located on the floor of the cavity beneath the proof mass, and a stiction bump on at least one of the second fingers facing a corresponding one of the first fingers.

25. The microelectromechanical device according to claim 24, wherein the first and second fingers have approximately equal widths in a direction parallel to a surface of the substrate.

26. The microelectromechanical device according to claim 24, wherein each of the tethers has a substantially constant width in a direction parallel to a surface of the substrate along a length of the tether between the proof mass and the rim.

27. The microelectromechanical device according to claim 24, wherein a stiction bump is present on each of the second fingers and the stiction bumps face the first fingers with which the second fingers are interdigitized.

28. The microelectromechanical device according to claim 24, wherein a plurality of stiction bumps are present on the floor of the cavity beneath only the proof mass.

29. The microelectromechanical device according to claim 24, wherein the proof mass surrounds a hub on the floor of the cavity and has a

peripheral region adjacent the first fingers, and wherein a first of the plurality of stiction bumps on the floor of the cavity surround the hub, a second of the plurality of stiction bumps on the floor of the cavity are directly beneath the peripheral region of the proof mass, and an annular-shaped central region of the cavity is free of stiction bumps.